Considerations for Planning and Management in the Northwest Sands

The following summarizes ecological considerations for planning and management in the Northwest Sands. Information is sourced from numerous documents, including primarily:

- The Ecological Landscapes of Wisconsin: an assessment of ecological resources and a guide to planning sustainable management (WDNR 2015)
- Rapid Ecological Assessments (for specific property groups; WDNR)
- Wisconsin Wildlife Action Plan (WDNR 2015)

The master planning process accounts for both ecological and recreation considerations. Though the two may seem distinct, they are intertwined: outdoor recreation opportunities are shaped by the ecological characteristics of a property. Thus, the ecological information presented here also influences recreation planning on DNR properties.

Natural Communities and Priority Habitats on DNR managed properties

Priority habitats and natural communities are the bedrock ecological considerations for master planning. These define the other ecological resources that may be present on a property. In seeking to maximize habitat and wildlife impacts with the resources available, DNR has created a listing of priority habitats. The top-rated priority habitats for northern Wisconsin are listed below:

Terrestrial/Wetland	Aquatic
Deep marsh/shallow lakes (only those with wild rice opportunity)	Coldwater Streams
Great lakes dunes, wetlands, and shores	Large Lake – deep, soft, and very soft, seepage
Oak/pine barrens	Large Lake – deep, soft, drainage
Old Forests (natural origin pine, hemlock, cedar, northern hardwoods)	Large Lake – shallow, soft, drainage
Young forests	Lake Superior
	Spring Pond, lake – spring
	Springs and Spring Runs (hard)
	Springs and Spring Runs (soft)

Natural communities present on a property are driven by the habitat type and represent more specific land cover classification than habitat type. The Wisconsin Wildlife Action Plan (WDNR 2015) and the Ecological Landscapes of Wisconsin (WDNR 2015) identify the following 35 natural communities for which there are "Major" or "Important" opportunities for protection, restoration, or management on DNR-managed properties in the Northwest Sands Ecological Landscape:

- Alder Thicket
- Aspen-Birch Forest
- Black Spruce Swamp
- Coldwater streams
- Coolwater streams
- Emergent Marsh
- Emergent Marsh - Wild Rice
- Floating-leaved Marsh
- Inland Beach
- Lacustrine Mud Flat
- Large Lake--deep, hard, seepage
- Large Lake--deep, soft and very soft, seepage
- Large Lake--shallow, hard, seepage
- Large Lake--shallow, soft, seepage
- Muskeg
- Northern Dry Forest
- Northern Dry-mesic Forest
- Northern Hardwood Swamp
- Northern Sedge Meadow
- Northern Tamarack Swamp
- Northern Wet Forest
- Northern Wet-mesic Forest
- Oak Barrens
- Open Bog
- Pine Barrens
- Poor Fen
- Riverine Impoundment
- Small Lake--Other
- Spring Pond, Lake--Spring
- Springs and Spring Runs (Hard)
- Springs and Spring Runs (Soft)
- Submergent Marsh
- Surrogate Grasslands
- Warmwater rivers
- Warmwater streams

Game Species

There are over 500,000 acres of lands available for public hunting, trapping and fishing in the four-county region surrounding the properties. Hunting is allowed on all undeveloped public property, private Managed Forest Law (MFL) land designated as open, and on industry owned forest lands in the region. This includes the Lyme St. Croix Forest Company land, protected with a 67,000-acre conservation easement. Common species in the area include black bear, Canada geese, ducks, ruffed grouse, white-tailed deer, wild turkey and woodcock. The deer populations in this ecological landscape are large compared to populations prior to Euro-American settlement. Relatively mild winters have increased winter survival and allowed the deer herd to increase. Over browsing is becoming common. When populations are high enough, limited sharp-tailed grouse hunting is allowed.

Bird Species - Resident and Migratory

The diversity of habitats on department properties in this region offers important resources for numerous bird groups.

Both riparian and large emergent wetlands with their associated open water areas provide important foraging areas for migratory birds such as waterfowl, shorebirds, songbirds, and waterbirds. Important features include emergent aquatic plants such as wild rice, bidens, hard and soft-stem bulrush, cat-tails, smartweed, and arrowheads; open water areas that team with amphibians, and aquatic invertebrates; and mudflats with abundant invertebrates and insect larvae. These areas are important to sandhill cranes, with more than 10,000 staging here during the fall migration. Other species that gather in large numbers are Canada geese, tundra and trumpeter swans. Migratory raptors use the open areas to hunt waterfowl, shorebirds, and other species.

Expanses of upland barrens communities provide nesting and foraging habitats for other migratory birds, including upland sandpipers, golden-winged warblers, and whip-poor-wills.

Numerous birds from the arctic and boreal regions winter here, including golden eagle, short-eared owl, rough-legged hawk, northern hawk owl, northern shrike, snow bunting, and common redpoll. These birds depend on the vast grasslands and wetlands. Other wintering birds of conservation importance include Lapland longspurs, horned larks, and snow buntings.

The Wisconsin sharp-tailed grouse population is segregated into isolated subpopulations that are primarily associated with intensively-managed barrens on Crex Meadows, Namekagon Barrens, and Douglas County wildlife areas, with smaller remnant populations elsewhere. Opportunities exist to re-connect grouse subpopulations and insure their presence into the future, by linking habitat areas that have become isolated and improving habitat quality.

Ten Important Bird Areas are designated within or partially within this Ecological Landscape (WDNR 2007) (see section entitled, Important Bird Areas).

Considering Species of Greatest Conservation Need

The Wisconsin Wildlife Action Plan identifies ecological priorities within each Ecological Landscape. Priorities represent the natural communities in each Ecological Landscape that are most important to Species of Greatest Conservation Need (SGCN). This concept is represented by the highlighted "priorities" section shown in the center of Figure 1. SGCN are native wildlife species with low or declining populations that are most at risk of no longer being a viable part of Wisconsin's fauna. The center "priorities" can also be used to determine which natural communities provide the most habitat for SGCN and rare plants (Figure 2). For detailed information specific to the Northwest Sands Ecological Landscape and these properties, including lists of species and the habitats with which they are associated, please see the Wildlife Action Plan and the appendices in the property-specific Rapid Ecological Assessments (WDNR 2010; WDNR 2011).

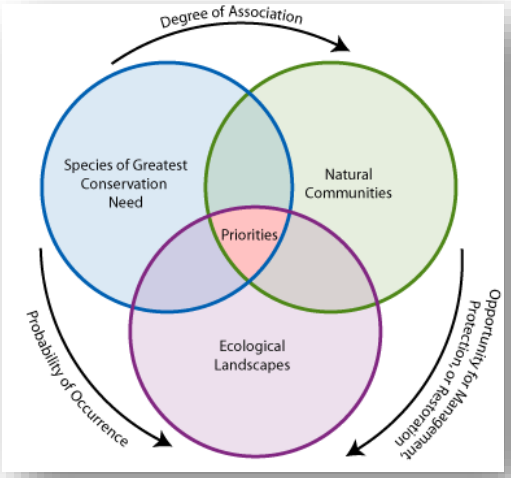

Figure 1: Illustration of the process used to identify Ecological Priorities in the Wisconsin Wildlife Action Plan.

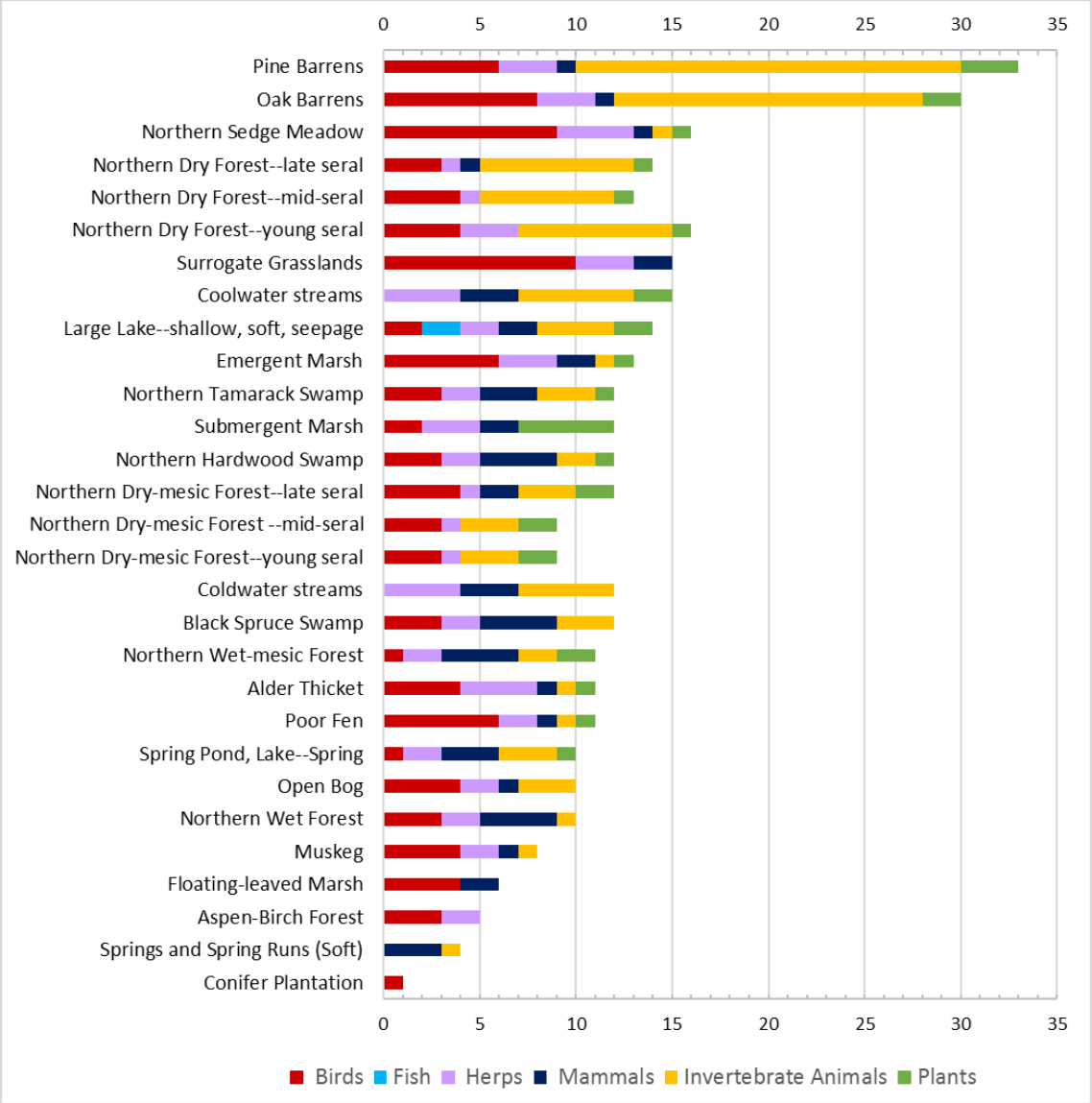

Figure 2. Number of SGCN and Rare Plants Highly or Moderately Associated with Natural Communities that have High or Moderate Opportunities for Protection, Restoration or Management in the Northwest Sands Ecological Landscape.[1]

Rare Animals

Wisconsin's Natural Heritage Inventory (NHI) Working List includes those species that are listed either at the Federal or State level. As of November 2009, NHI documented 89 rare species fauna within the Northwest Sands Ecological Landscape including 4 mammals, 28 birds, 7 herptiles, 6 fishes, and 44 invertebrates. These include two U.S.

[1] Teams of species and natural community experts and professionals assigned association scores to each species and natural community combination and opportunity scores to each natural community and ecological landscape combination. Each combination was ranked by team participants as high, moderate, low or none. Definitions for each level may be found at: http://dnr.wi.gov/topic/WildlifeHabitat/documents/AOScoresmetadata.pdf.

Endangered species, 4 Wisconsin Endangered species, 11 Wisconsin Threatened species, and 74 Wisconsin Special Concern species.

Rare Plants
The rare plant database of WDNR's Natural Heritage Inventory (WDNR 2009) contains records for 46 vascular plant species occurring within the Northwest Sands Ecological Landscape that are currently listed as Endangered (4), Threatened (9), or Special Concern (33) by the state of Wisconsin.

Priority Species Management Plans
Two priority species have distinct management objectives and population recovery activities for them, developed outside this planning process: 1) the federally endangered Karner blue butterfly and 2) the sharp-tailed grouse,

Karner blue butterfly populations have been tracked through annual surveys in this region since 2008. Populations have been low but persistent. The goal for Karner blue butterfly (KBB) recovery in the area is to establish and maintain a large viable population (>6000 KBB) to meet federal delisting criteria for the KBB Recovery Plan (USFWS, 2003). The objective is to restore and maintain suitable occupied habitat across the landscape to support the needed large viable population, using accepted barrens restoration practices. The KBB depends on wild lupine as its plant host plant, and significant populations of both butterfly and plant exist on properties such as Crex Meadows and Fish Lake wildlife areas. WDNR is a partner in the U.S. Fish and Wildlife Service's Habitat Conservation Plan for Karner blue butterflies. Under this agreement, WDNR agrees to adopt certain management restrictions within KBB range, including some DNR properties.

Sharp-tailed grouse populations on managed properties in Wisconsin are well below historic levels, and in 2013, were 24% lower than the average number of dancing males during 2008-2012. Populations have been declining since 1998, according to the Wisconsin Sharp-tailed Grouse Survey and Status. (WDNR 2015a). Management of sharp-tailed grouse oak/pine barrens habitat is critical in this region for the species to continue to exist here.

Primary Sites: Site-specific Opportunities for Biodiversity Conservation

"Primary Sites" are identified during the **Rapid Ecological Assessment** (REA) process and included in REA reports prepared by the department (NHC program) for special consideration during the master planning process. Primary Sites encompass the best examples of 1) rare and representative natural communities and 2) documented rare species populations with opportunities for restoration or connections[1]. Primary sites warrant high protection and/or restoration. All Primary Sites can be considered High Conservation Value Forests for purposes of Forest Certification.

REAs help summarize projects that collected biological inventory information about DNR properties. They document and help evaluate potential habitat for rare species and identify natural community management opportunities. These reports are accessible to the public via the department's webpage.

Existing NHI data are often the starting point for conducting this biotic inventory to support master planning. Rapid taxa surveys are limited in scope and focus on documenting high quality natural communities, rare plants, breeding

[1] The NHC program is collecting/analyzing field data to finalize Primary Site determinations by August 2018.

birds, herptiles, and, for some properties, aquatic and terrestrial invertebrates. The collective results from these surveys are used to identify ecologically important areas (Primary Sites) on the properties.

Survey locations are identified or guided by using recent aerial photos, USGS 7.5' topographic maps, various Geographic Information System (GIS) sources, information from past survey efforts, discussions with property managers, and the expertise of biologists who are familiar with the properties or with similar habitats in the region. Based on property location and ecological setting, inventory considerations include the identification of high quality forests and other upland and wetland communities, with the potential to support rare species. Private lands surrounding the properties are not surveyed. All Primary Sites can be considered High Conservation Value Forests for the purpose of Forest Certification.

For information about primary sites on properties with current ch. NR 44-approved plans, see the 'completed master plans' tab on the DNR master plan web page, to access the specific master plan.

Primary Sites for properties specifically being updated in this 2018 plan are listed below. Site boundaries and acreages provided are approximations.

1) Inch Lake State Natural Area
2) Etc.

ADDITIONAL REGIONAL & PROPERTY ATTRIBUTES

Additional large-scale research and planning efforts that previously identified significant ecological attributes in the Northwest Sands Ecological Landscape are worth consideration. The features they identified, or the subsequent rules or designations that resulted, are listed below.

Land Legacy Report

The Land Legacy Report (WDNR 2006b) was designed to identify Wisconsin's most important conservation and recreation needs for the next 50 years. The following "Legacy Places" received the highest ranking (5 stars), implying that if restoration efforts are needed for the area, conservation actions would have a high likelihood of long-term success.

- Bois Brule River
- Crex Meadows Wildlife Area
- Danbury to Sterling Corridor
- Namekagon-Brule Barrens
- Namekagnon River
- St. Croix River

The Northwest Sands Ecological Landscape is identified as one of the two best places in North America to restore the globally rare Pine and Oak Barrens natural communities.

Wisconsin Wildlife Action Plan: Conservation Opportunity Areas

The Wisconsin Wildlife Action Plan (WDNR 2015) identifies Conservation Opportunity Areas (COA) in Wisconsin that contain ecological features, natural communities, and/or Species of Greatest Conservation Need (SGCN) habitat for which Wisconsin has a unique responsibility for protecting, when viewed from the global, continental, upper Midwest, or state perspective. (see COA map). The COAs in this landscape include:

- The Pine-Oak Barrens COA: **global significance** because few examples of barrens ecosystems remain worldwide. Large-scale barrens management opportunities exist in this landscape due to the relatively large amount of public lands owned by state and county government (WDNR 2005).

- Douglas and Bayfield County Barrens COA: **global significance** and one of the best areas nationwide to manage for globally rare pine barrens and associated species like sharp-tailed grouse, upland sandpiper, and Connecticut warbler.

- Blueberry Swamp COA: **statewide significance**; it encompasses the Brule Spillway as well as Blueberry Swamp and is notable for supporting some of the most extensive and high-quality wetlands in the state, such as white-cedar swamps and hardwood swamps, along with associated rare species and highly regarded trout streams.

- Brule Boreal Forest COA: with its remnant stands of Boreal Forest, this COA of **continental significance** encompasses the most extensive restoration opportunities for clay plain Boreal Forest on public land in the state, and possibly North America. It also includes extensive undeveloped tracts of Lake Superior shoreline and the Brule River mouth, a small freshwater estuary supporting large concentrations of migratory birds.

Important Bird Area
At least six Important Bird Areas (IBA; WDNR 2007) in this landscape are critical sites for the conservation and management of Wisconsin's birds. These are all located on properties with existing NR 44 master plans within this (2018) Northwest Sands master plan update.

Outstanding and Exceptional Resource Waters (ORW and ERW)
These officially designated waters (ch. NR 102.11 Wis. Admin. Code) provide outstanding recreational opportunities, support valuable fish and wildlife habitat, have good water quality, are not significantly impacted by human activities, and are recognized as being the highest quality waters in the state. **ORWs** comprise less than 1% of over 15,000 rivers, lakes, and waterbodies in WI; they typically do not have any point sources discharging pollutants directly to the water (for instance, no industrial sources or municipal sewage treatment plants) and no increases of pollutant levels are allowed. If a waterbody has existing point sources at the time of designation, it is more likely to be designated as an **ERW**. Examples include:

ORW
- Totogatic River (Totogatic Wild River Area) {also named one of Wisconsin's five designated "wild rivers"}
- The Bois Brule River State Forest has numerous streams and several lakes designated Outstanding and Exceptional Resource Waters (WDNR 2016)
- Beaver Brook
- Namekagon River
- Clam River - upper and northfFork segments

ERW
- Clam River - lower segment
- Arnold Creek, Bacon Creek, and other small tributaries of the St. Croix River
- Portions of Bean Brook and Little Bean Brook

Wetland Gem Designation
The Wisconsin Wetlands Association identifies 10 high-quality sites in the Northwest Sands as "Wetland Gems" in its publication, Wisconsin Wetland Gems. The 'gems' on DNR properties are:
- Black Lake Bog
- Blomberg Lake
- Brule Glacial Spillway
- Crex Meadows

- Fish Lake Meadow
- St. Croix & Namekagon River Corridor

The Northwest Sands Landscape Level Management Plan (NWRPC & WDNR 2000), prepared by the Northwest Regional Planning Commission and Wisconsin DNR, includes the Northwest Barrens properties. Strengths identified within this landscape are the large public land base, including state and county-owned properties and numerous options for habitat management of Pine and Oak Barrens. Opportunities include:

- connecting properties to enhance landscape-scale management that benefits numerous rare species
- creating a greater diversity of common and game species
- a high concentration of State Natural Areas
- providing large wildlife habitat areas attracting wildlife viewers
- increasing potential for ecological research sites

Grassland Bird Habitat Management
Namekagon and Douglas County Barrens are among the highest-ranking priority landscapes for grassland bird management. Mowing, prescribed burning and forestry practices (cut-overs and fire breaks) are noted tools to restore barrens habit (Sample and Mossman 1997).

Wisconsin Sharp-tailed Grouse: A Comprehensive Management and Conservation Strategy (1953-2011)
The 1953 Wisconsin Prairie Grouse Management Policy was a noteworthy historical agreement "that every reasonable effort be made to maintain a huntable population through management and restoration of habitat for these birds in the state and to assure their presence for future generations." This was to ensure all other pine/oak barren wildlife species, much of them game species, would be properly managed.

The goal of the 2011 Wisconsin management plan for sharp-tailed grouse is "to ensure a viable population of sharp-tailed grouse within the state that also provides opportunities for regulated harvest." The plan is "to accomplish this goal by focusing our management and research efforts on the existing core range of sharp-tailed grouse in northern Wisconsin." The vision is to develop and facilitate a voluntary and cooperative partnership among public and private organizations to ensure the long-term viability of sharp-tailed grouse populations in Wisconsin through an ecological landscape and conservation area or focus area approach. The core sharp-tailed grouse population occurs within the Northwest Sands EL.

Connecting Upland Activities to Protection of Groundwater and Surface Waters
The Northwest Sands Properties and surrounding lands drain to four of the highest quality rivers in northwest Wisconsin and in the state: the St. Croix and Namekagon rivers, both **federally designated Wild and Scenic Rivers,** and the Totogatic River, one of five **state-designated Wild Rivers**, and the Bois Brule River. There are also numerous high quality lakes, wetlands and streams fed by the water moving over and through this landscape. The water quality of these surface waters and the health of the organisms they support is dependent on both the quantity and quality of the groundwater recharging them and the runoff that enters them over land. It is likely that the many acres of sand providing filtration have helped protect and enhance the quality of these surface waters over past centuries.

The sandy soils in the area can transmit precipitation to the groundwater rapidly. Any pollutants or contaminants that contact the ground surface can affect groundwater quality directly, and surface water quality indirectly. Careful land management to prevent migration of materials applied to the land (fertilizers, pesticides, etc.) is important to prevent seepage to groundwater or runoff to surface water. Safe transport and storage of materials that could be considered contaminants (in either groundwater or surface water) is also important on and around these properties.

Recreation Considerations

Outdoor recreation in the Superior Coastal Plain is diverse. From camping and hiking to ATV riding and hunting, residents and visitors take part in a wide variety of activities in the Superior Coastal Plain. Extensive investigation into the recreation needs and opportunities of the public have been undertaken in the Statewide Comprehensive Outdoor Recreation Plan (SCORP) and Recreation Opportunity Analysis (ROA) processes. The results of these processes are used in the property master planning process. The information from the SCORP and ROA processes that will be used in planning for the Superior Coastal Plain is summarized in the Recreation Resources and Opportunities of the Superior Coastal Plain folder of this master planning web page.

Additional Considerations

"The Ecological Landscapes of Wisconsin: an assessment of ecological resources and a guide to planning sustainable management" (WDNR 2015) gave additional considerations for planning and management in the Superior Coastal Plain. These considerations are reproduced below.

> Lakeshore development has been occurring at a rapid rate, partly because of this ecological landscape's close proximity to the Minneapolis-St. Paul metropolitan area. The sandy soils are low in productivity and highly erodible, and great care must be taken when planning and conducting timber harvests, and in using motorized recreational vehicles such as ATVs, to avoid causing damage to slopes and fragile vegetation. Many rare plants and animals occur here, especially in the barrens and sedge meadow habitats, which need consideration when planning and conducting management activities. Increasing connectivity between patches of open or semi-open lands such as pine or oak barrens remnants, and reducing habitat fragmentation and isolation, are major management considerations for the Northwest Sands. Achieving greater connectivity between open habitats may be accomplished by the use of firebreaks, timber sales, rights-of-way, pastureland, CRP, or other types of non-forested cover. There is typically sharp contrast ("hard edge") between the open, non-forested habitats and the surrounding dry forests. Identifying areas where some of this high contrast hard edge may be reduced is needed to plan for and provide greater structural variability in the dynamic barrens ecosystems and to better meet the needs of species not well adapted to either very open or densely canopied habitats. Much of the vegetation here is dependent on periodic disturbance, especially via the use of prescribed fire. Some types of land disturbance can facilitate the colonization and spread of invasive plants. Leafy spurge and spotted knapweed are among the invasive plants currently posing problems in sandy uplands. Common reed and purple loosestrife is present in some open wetlands and may be increasing. Glossy buckthorn has been reported from the extensive cedar swamps along the upper Brule River.
>
> The Northwest Sands is the best place in Wisconsin to manage for the globally rare Pine Barrens community. Large-scale barrens management is possible here because of the ecological suitability of the land, the presence of numerous remnants, and substantial public ownership. There are opportunities to connect existing barrens remnants and restoration projects with corridors and manage them with a mosaic of compatible vegetation types. Prescribed fire and other management tools can be used to develop more diverse structural characteristics, and to enhance or restore species composition in many pine-oak barrens communities. Some of the state's best places to manage for dry forests of jack pine, northern pin oak, and red pine are found here. There are also opportunities to manage for older dry-mesic white pine/red pine/red oak forests, in the rugged northern part of the ecological landscape, on the slopes above the Bois Brule River in Douglas County, along the St. Croix River in Burnett and Polk counties, and at scattered locations elsewhere.
>
> Wetlands are extensive, provide habitat for many sensitive species and represent major management opportunities. The open meadows and marshes in the southwestern part of the Northwest Sands are particularly important because of their size, condition, intact hydrology, and the presence of numerous

habitat specialists. Some of the larger marshes are within the managed flowages at Crex Meadows and Fish Lake Wildlife Areas, and at Gordon on the St. Croix River. Acid peatlands of black spruce-tamarack swamp, muskeg, open bog, and poor fen are widespread and common, especially in areas of pitted outwash, where lakes and poorly drained kettle depressions are important landscape features.

The Northwest Sands harbors significant concentrations of glacial kettle lakes. Development pressures are high. The lakes provide high quality habitats for aquatic organisms, resident and migratory birds, and many other species. Inland Beaches are rare, localized, or absent in most of Wisconsin. Here, beach communities occupy the sand and gravel littoral zones of softwater seepage lakes with upland shorelines and which experience naturally fluctuating water levels. There is a need to conduct an inventory of lacustrine and beach habitats to identify the best occurrences and associated rare species populations. The protection of undeveloped lakes and associated high-quality habitats is a significant opportunity in the Northwest Sands.

The St. Croix, Namekagon, Totogatic, Bois Brule, and Eau Claire rivers warrant special attention because of their excellent water quality, exceptional aquatic biota, recreational opportunities, and aesthetic features. The north-south orientation of the St. Croix and Bois Brule rivers, along with the generally unfragmented condition of the forests bordering these rivers, makes them highly significant to migratory birds and probably, to other species. The extensive white cedar swamp along the upper Bois Brule River is among Wisconsin's best examples of that community type and merits strong protection. Excellent occurrences of alder thicket, springs and spring seeps, and spring ponds also occur along the upper Brule and present additional management and protection opportunities.